ELSEVIER

Environmental Pollution 120 (2002) I–VIII

ENVIRONMENTAL POLLUTION

www.elsevier.com/locate/envpol

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PII: S0269-7491(02)00327-5

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A. GERHARDT, S. SCHMIDT, S. HÖSS (Germany)
The Multispecies Biomonitor® (MFB) shows promise in monitoring nematodes in sediments.

517 Stability of green fluorescent protein using luminescence spectroscopy: is GFP applicable to field analysis of contaminants?
C.B. SMITH, J.E. ANDERSON, R.L. FISCHER, S.R. WEBB (USA)
Expansion of green fluorescent protein in genetically modified Bacillus subtilis endospores was greatest at pH 7.0.

521 Ozone and bean plants: morphology matters
V. ELAGÖZ, W.J. MANNING (USA)
Relationship between leaf morphology and cultivar sensitivity to ozone were established.

525 Environmental chemicals with known endocrine potential affect yolk protein content in the aquatic insect *Chironomus riparius*
T. HAHN, K. SCHENK, R. SCHULZ (Germany)
Chironomid vitellogenesis may be a valuable marker for endocrine-disrupting effects on aquatic insects.

529 Immunohistochemical detection of polychlorinated biphenyls in field collected damselfish (*Abudefduf sordidus*; Pomacentridae) embryos and larvae
L.M. KERR LOBEL, E.A. DAVIS (USA)
Immunochemical techniques can also be used to detect PCBs in vertebrates.

Reviews

533 Review of indoor emission source models. Part 1. Overview
Z. GUO (USA)
Fifty-two indoor emission source models are compiled and briefly discussed for their validity and usefulness.

551 Review of indoor emission source models. Part 2. Parameter estimation
Z. GUO (USA)
Forty-eight methods for estimating the parameters in the indoor emission source models are compiled and reviewed.

565 Sampling and physico-chemical analysis of precipitation: a review
S.V. KRUPA (USA)
This is a comprehensive review of methods for sampling and physico-chemical analysis of rain, cloud and fog water and snow, as they relate to atmospheric processes and environmental impacts assessment.

Research papers

595 Temporal variability of bioavailable Cd, Hg, Zn, Mn and Al in an upwelling regime
M. LUCILA LARES, G. FLORES-MUÑOZ, R. LARA-LARA (Mexico)
Cadmium increases in Mytilus californianus *and* Macrocystis pyrifera *were related to Cd inputs from upwelling.*

609 An experimental set up of a PAH vapour generator and its use to test an annular denuder
B. TEMIME, S. FRANCOIS, A. MONOD, H. WORTHAM (France)
A PAH vapour generator has been developed that makes it possible to generate a constant airflow under various environmental conditions.

617 Environmental impact of two successive chemical treatments in a small shallow eutrophied lake: Part I. Case of aluminium sulphate
E.V. HULLEBUSCH, V. DELUCHAT, P.M. CHAZAL, M. BAUDU (France)
Aluminium sulphate had variable effects on water quality.

627 Environmental impact of two successive chemical treatments in a small shallow eutrophied lake: Part II. Case of copper sulfate
E.V. HULLEBUSCH, V. DELUCHAT, P.M. CHAZAL, M. BAUDU (France)
Cyanobacteria and Microcystis *were kept under control by copper sulfate.*

635 Potential sensitivity of mires to drought, acidification and mobilisation of heavy metals: the sediment S/(Ca+Mg) ratio as diagnostic tool
E.C.H.E.T. LUCASSEN, A.J.P. SMOLDERS, J.G.M. ROELOFS (The Netherlands)
The sensitivity of mires to drought and acidification can be related to the ratio of S/(Ca+Mg) in the sediments.

647 Satellite image analysis of human caused changes in the tundra vegetation around the city of Vorkuta, north-European Russia
T. VIRTANEN, K. MIKKOLA (Finland), E. PATOVA (Russia), A. NIKULA (Finland)
Satellite image analysis was effective in detecting anthropogenic changes in vegetation around an industrial center.

659 Spatial variability of ammonium and nitrate in soils near a poultry farm
L. FORMOSA, B. SINGH (Australia)
Vegetation reduced the impacts of nitrogen deposition from a poultry farm.

671 Pattern recognition of the movement tracks of medaka (*Oryzias latipes*) in response to sub-lethal treatments of an insecticide by using artificial neural networks
I.-S. KWAK, T.-S. CHON, H.-M. KANG, N.-I. CHUNG, J.-S. KIM, S.C. KOH, S.-K. LEE, Y.-S. KIM (South Korea)
An artifical neural network was used to detect the effects of diazinon on medaka.

683 Endocrine effects of sublethal exposure to persistent organic pollutants (POPs) on silver carp (*Hypophthalmichthys molitrix*)
Y. XU, J. ZHANG, W. LI (China), K.-W. SCHRAMM, A. KETTRUP (Germany)
Endocrine disrupting effects of selected POPs on silver carp are reported.

691 Runoff rates, chemical speciation and bioavailability of copper released from naturally patinated copper
C. KARLÉN, I. ODNEVALL WALLINDER (Sweden), D. HEIJERICK (Belgium), C. LEYGRAF (Sweden)
Results are presented on toxicity of copper in runoff water on a bacterium and an alga immediately after leaving a roof.

701 The impact of ozone on a salt marsh cordgrass (*Spartina alterniflora*)
M.D. TAYLOR, J.P. SINN, D.D. DAVIS, E.J. PELL (USA)
Plants from different regions responded differently to ozone exposure in Pennsylvania.

707 Investigation of influence of tunsten mine wastes on the elemental composition of some alpine and subalpine plants on Mount Uludağ, Bursa, Turkey
G. GÜLURYÜZ, H. ARSLAN, S. KIRMIZI, S. GÜÇER (Turkey)
Elements accumulated by plants appeared to be species specific.

717 A decision support system for wet soil cleaning
P. REM, M. PRUIJN, C. VAN HOEK, L. VAN KOOY (The Netherlands)
Newly developed software can predict the essential characteristics of a sand product.

725 Spider webs as environmental indicators
G.C. HOSE, J.M. JAMES, M.R. GRAY (Australia)
Spider webs provide a useful indicator of enviromental pollution and chemistry.

735 4-*n*-Nonylphenol and 17-β estradiol may induce common DNA effects in developing barnacle larvae
F.A. ATIENZAR, Z. BILLINGHURST, M.H. DEPLEDGE (UK)
NP and E_2 induce common changes in RAPD profiles in barnacle larvae.

739 Contaminants and their effects on estuarine and coastal organisms in the United Kingdom in the late twentieth century
P. MATTHIESSEN, R.J. LAW (UK)
The entire field of contaminant effects in UK estuarine and coastal waters is reviewed, focusing on recent years and recommendations for monitoring/research.

759 Relating cadmium concentrations in three macrophyte-associated freshwater invertebrates to those in macrophytes, water and sediments
J.C. DÉSY, M. AMYOT, B. PINEL-ALLOUL, P.G.C. CAMPBELL (Canada)
Cadmium (Cd) in three macrophyte-associated invertebrates is more tightly linked to Cd in their food than Cd in water or sediments.

771 *Escherichia coli* and total coliforms in water and sediments at lake marinas
Y.-J. AN, D.H. KAMPBELL, G. PETER BREIDENBACH (USA)
Escherichia coli levels in surface water increase due to resuspension of sediment-bound bacteria by recreational boating activities at lake marinas.

779 *Euglena gracilis* as a model for the study of Cu^{2+} and Zn^{2+} toxicity and accumulation in eukaryotic cells
M. EINICKER-LAMAS, G.A. MEZIAN, T.B. FERNANDES, F.L.S. SILVA, F. GUERRA, K. MIRANDA, M. ATTIAS, M.M. OLIVEIRA (Brazil)
The proto209 Euglena gracilis *is an effective model for studies of copper and zinc toxicity and responses at the sub-cellular level.*

787 The effects of Orimulsion and Fuel Oil 6 on the hatching success of copepod resting eggs in the seabed of Tampa Bay, Florida
B.L. SUDERMAN, N.H. MARCUS (USA)
Copepod resting eggs did not experience mortality upon exposure to petroleum products.

797 Shift in ectomycorrhizal community composition in Scots pine (*Pinus sylvestris* L.) seedling roots as a response to nickel deposition and removal of lichen cover
A.M. MARKKOLA (Finland), U. AHONEN-JONNARTH (Sweden), M. ROITTO, R. STRÖMMER, M. HYVÄRINEN (Finland)
Lichen removal and wet deposition of nickel affects the ectomycorrhizal fungal community in the roots of Scots pine seedlings.

805 Uptake and effects of the cypermethrin-containing sea lice treatment Excis® in the marine mussel, *Mytilus edulis*
B. GOWLAND, L. WEBSTER, R. FRYER, I. DAVIES, C. MOFFAT, R. STAGG (UK)
High concventration ofd cypermethrin cause valve closing in Mytilus edulis*, but do not alter aerial survival time, or neutral red retention time.*

813 Fine structure and X-ray microanalysis of a red macrophyte cultured under cadmium stress
L. TALARICO (Italy)
Electron microscopy and X-ray analysis revealed changes at the sub-cellular level in red algae exposed to cadmium.

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